AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (original) A channel estimation apparatus in a digital communication system comprising:

a correlation unit for obtaining a correlation function of a first received signal by means of a correlation between a received synchronizing signal and a reference synchronizing signal, and obtaining a correlation function of the received synchronizing signal by means of a correlation between the synchronizing signals;

a first estimating unit for estimating a first multi-path by applying a first threshold value to the correlation function of the first received signal;

a correlation noise removing unit for obtaining a correlation function of a second received signal by removing correlation noise included in the correlation function of the first received signal, by means of the first multi-path; and

a second estimating unit for estimating a second multi-path by applying a second threshold value to the correlation function of the second received signal in which the correlation noise has been removed.

2. (original) The channel estimation apparatus in a digital communication system as claimed in claim 1, wherein the correlation noise removing unit obtains a channel impulse

response function $h_{\tau m}$ backtracked by means of the first multi-path $y_{\tau m}$ in which τm represents a location of the estimated multi-path, obtains a correlation function y_n' of a third received signal by means of the backtracked channel impulse response function $h_{\tau m}$, obtains the correlation noise N_n by subtracting the backtracked channel impulse response function $h_{\tau m}$ from the correlation function y_n' of the third received signal, and obtains the correlation function y_n'' of the second received signal by removing the correlation noise N_n from the correlation function y_n of the first received signal.

3. (original) The channel estimation apparatus in a digital communication system as claimed in claim 2, wherein the backtracked channel impulse response function $h_{\tau m}$ is defined by an equation,

$h_{\tau m} = x_{\tau m}^{-1} \, y_{\tau m}$, wherein $x_{\tau m}$ is the correlation function x_n of the synchronizing signal corresponding to τm .

4. (original) The channel estimation apparatus in a digital communication system as claimed in claim 2, wherein the correlation noise N_n is defined by an equation,

$N_n = y_n' - h_{\tau m}$.

5. (original) The channel estimation apparatus in a digital communication system as claimed in claim 2, wherein the correlation function y_n" of the second received signal is defined by an equation,

$$y_n^{"} = y_n - N_n = y_n - (y_n^{'} - h_{\tau m})$$

6. (original) The channel estimation apparatus in a digital communication system as claimed in claim 1, wherein the correlation noise removing unit removes the correlation noise in sequence according to a size of the first multi-path $y_{\tau m}$.

7. (original) The channel estimation apparatus in a digital communication system as claimed in claim 1, wherein the correlation noise removing unit removes the correlation noise according to a sequence in which the first multi-path $y_{\tau m}$ is received.

8. (original) The channel estimation apparatus in a digital communication system as claimed in claim 1, wherein the reference synchronizing signal is a PN sequence.

9. (original) A channel estimation method in a digital communication system comprising the steps of:

(1) obtaining a correlation function of a first received signal by means of a correlation between a received synchronizing signal and a reference synchronizing signal, and obtaining a

correlation function of the received synchronizing signal by means of a correlation between the synchronizing signals;

(2) estimating a first multi-path by applying a first threshold value to the correlation function of the first received signal, which represents a location of the estimated multi-path;

(3) obtaining a correlation function of a second received signal by removing a correlation noise included in the correlation function of the first received signal, by means of the first multi-path, and

(4) estimating a second multi-path by applying a second threshold value to the correlation function of the second received signal in which the correlation noise has been removed.

10. (original) The channel estimation method in a digital communication system as claimed in claim 9, wherein, in step 3, channel impulse response function $h_{\tau m}$ backtracked by means of the first multi-path $y_{\tau m}$ is obtained, a correlation function y_n' of a third received signal is obtained by means of the backtracked channel impulse response function $h_{\tau m}$, the correlation noise N_n is obtained by subtracting the backtracked channel impulse response function $h_{\tau m}$ from the correlation function y_n' of the third received signal, and the correlation function y_n'' of the second received signal is obtained by removing the correlation noise N_n from the correlation function y_n of the first received signal.

11. (original) The channel estimation method in a digital communication system as claimed in claim 10, wherein the backtracked channel impulse response function $h_{\tau m}$ is defined by an equation,

$h_{\tau m} = x_{\tau m}^{-1}\, y_{\tau m}$, wherein $x_{\tau m}$ is the correlation function x_n of the synchronizing signal corresponding to τm.

12. (original) The channel estimation method in a digital communication system as claimed in claim 10, wherein the correlation noise N_n is defined by an equation,

$$N_n = y_n' - h_{\tau m}.$$

13. (original) The channel estimation method in a digital communication system as claimed in claim 10, wherein the correlation function y_n'' of the second received signal is defined by an equation,

$$y_n'' = y_n - N_n = y_n - (y_n' - h_{\tau m}).$$

14. (original) The channel estimation method in a digital communication system as claimed in claim 9, wherein, in step 3, the correlation noise is removed in sequence according to a size of the first multi-path $y_{\tau m}$.

15. (currently amended): The channel estimation method in a digital communication system as claimed in claim 9~~1~~, wherein in step 3, the correlation noise is removed according to a sequence in which the first multi-path $y_{\tau m}$ is received.

16. (original) The channel estimation method in a digital communication system as claimed in claim 9, wherein the reference synchronizing signal is a PN sequence.